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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/728,732	11/28/2000	H. Sam Bergh	99-1CIP1DIV1	7350
22903 T990 01/26/2004 SYMYX TECHNOLOGIES INC LEGAL DEPARTMENT 3100 CENTRAL EXPRESS SANTA CLARA, CA 95051			EXAMINER QUAN, ELIZABETH S	
			ART UNIT 1743	PAPER NUMBER

DATE MAILED 01/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 09/728,732	Applicant(s) BERGH ET AL 
Examiner Elizabeth Quan	Art Unit 1743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 116-118, 120-128, 130, 139-145, 147, 148, 150-160, 162-166 and 184-195 is/are pending in the application
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 116-118, 120-128, 130, 139-145, 147, 148, 150-160, 162-166 and 186-195 is/are allowed.
- 6) ☒ Claim(s) 184 and 185 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 184 and 185 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 5,580,523 to Bard.

Bard discloses a method for effecting a microscale chemical reaction (abstract). Reagents are fed to a mixer and discharged to a microreactor comprising a surface defining a reaction cavity, which is capable of handling reaction volumes preferably between 1 nanoliter and 10 microliters (col. 3, lines 33-36 and 45-50; col. 7, lines 10-16). Figs. 1d and 2 show a microreactor (100) comprising a surface defining a reaction cavity (4) with an inlet port in fluid communication with the reaction cavity for supplying one or more reactants thereto and an outlet port (11) in fluid communication with the reaction cavity for discharging one or more reaction products therefrom (col. 5, lines 36 and 37). Fig. 4 shows a microreactor (R) comprising a surface defining a reaction cavity with an inlet port in fluid communication for supplying one or more reactants thereto and an outlet port in fluid communication with the reaction cavity for discharging one or more reaction products therefrom (col. 7, lines 10-20). Fig. 8 shows a microreactor (507) comprising a surface defining a reaction cavity on which the enzyme penicillin acylase has been immobilized (example 4: col. 8, lines 53-67). The enzyme is

considered a catalyst (example 4: col. 8, lines 53-67). Aqueous acid and filtered BP is fed to the microreactor through an inlet port, such that the BP is converted on the wall of the reaction cavity and exits through the outlet port for ion exchange purification (example 4: col. 8, lines 53-67). Fig. 9 shows a microreactor (605) comprising a surface defining a reaction cavity containing a packed bed of Pt-Al₂O₃ catalyst held at 400 degrees Celsius (example 5: col. 9, lines 1-16). Liquid n-heptane is metered into the vaporizing chamber (604) (example 5: col. 9, lines 1-16). The reaction cavity has an inlet port by which gaseous toluene is conveyed to the reaction cavity and first outlet port by which hydrogen is removed and second outlet port by which the heptane-toluene mixture is removed from the reaction cavity and fed to the separator (example 5: col. 9, lines 1-16).

Bard discloses that the system has an inner diameter of up to 100 micrometers to optimize control of residence time within the reaction cavity. It appears that the residence time is longer than the diffusion time for the reactants to contact the catalysts in Example 5 or reactants to contact the enzymes in Example 4. In the event one would argue that the residence time is not longer than the diffusion time, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Bard to have a longer residence time than diffusion time to ensure a sufficiently high conversion of the reactants whether it is between among reactants or reactants and catalysts or enzymes. Furthermore, it has been held that discovering optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233), such that maintaining a longer residence time over diffusion time is optimal for the purpose of high conversion and maintaining a longer diffusion time over residence is optimal for the purpose of efficiency of the operation while sacrificing conversion.

Allowable Subject Matter

3. Claims 116-118, 120-128, 130, 139-145, 147, 148, 150-160, 162-166, and 186-195 are allowed.

4. The following is a statement of reasons for the indication of allowable subject matter:

U.S. Patent No. 6,190,624 to Romatier does not teach or fairly suggest the at least four catalyst materials are loaded into the four or more microreactors as a material-containing laminate comprising a substrate and the at least four catalyst materials at separate portions of the substrate as recited in claims 116, 123.

U.S. Patent No. 6,190,624 to Romatier does not teach or fairly suggest evaluating the at least four candidate catalyst materials for catalytic activity for the chemical reaction of interest as recited in claims 130, 139, 140, 145.

U.S. Patent No. 6,190,624 to Romatier does not teach or fairly suggest simultaneously discharging a reactor effluent from each of the four or more microreactors to four or more microseparators as recited in claim 162.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Quan whose telephone number is (571) 272-1261. The examiner can normally be reached on M-F (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Art Unit: 1743

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Elizabeth Quan
Examiner
Art Unit 1743

eq


Elizabeth Quan
Supervisory Patent Examiner
Technology Center 1700